

What is claimed is:

1. An image forming apparatus in which a toner image carried on a latent image carrier is primarily transferred onto a surface of an intermediate transfer medium which rotates and a primarily transferred toner image thus formed on said intermediate transfer medium is secondarily transferred and fixed at the same time on a recording medium, comprising:

heating means which is disposed between a primary transfer position for said primary transfer and a secondary transfer position for said secondary transfer, and which heats up a primarily transferred toner image before secondarily transferring; and

secondary transfer means which is disposed at said secondary transfer position and which secondarily transfers and fixes said primarily transferred toner image on said recording medium while cooling said intermediate transfer medium.

2. The image forming apparatus of claim 1, wherein said secondary transfer means comprises a front surface side roller which is disposed on the front surface side to said intermediate transfer medium at said secondary transfer position, and which rotates while abutting on said recording medium and accordingly transports said recording medium while pressuring said recording medium toward said intermediate transfer medium; and

the thermal capacity per unit surface area of said front surface side roller is larger than the thermal capacity per unit surface area of said intermediate transfer medium.

3. The image forming apparatus of claim 2, wherein said secondary transfer means further comprises a back surface side auxiliary roller which is disposed on the back surface side to said intermediate transfer medium on the downstream side to said heating means along the rotating direction of said intermediate transfer medium but the upstream side to said secondary transfer position, and which rotates while abutting on said intermediate transfer medium; and

the thermal capacity per unit surface area of said back surface side auxiliary roller is larger than the thermal capacity per unit surface area of said intermediate transfer medium.

4. The image forming apparatus of claim 2, further comprising temperature adjusting means which adjusts a surface temperature of said front surface side roller.

5. The image forming apparatus of claim 2, further comprising transfer bias applying means which applies a transfer bias upon said secondary transfer means to thereby facilitate transfer of toner onto said recording medium from said intermediate transfer medium.

6. The image forming apparatus of claim 1, wherein said secondary transfer means comprises a front surface side roller, which is disposed on the front surface side to said intermediate transfer medium at said secondary transfer position and rotates while abutting on said recording medium and accordingly transports said recording medium, and a back surface side roller which is disposed on the back surface side to said intermediate transfer medium at said secondary transfer position and rotates while abutting on said intermediate transfer medium;

said intermediate transfer medium and said recording medium are firmly held between said front surface side roller and said back surface side roller, and accordingly brought into pressure contact with each other; and

the thermal capacity per unit surface area of at least one of said front surface side roller and said back surface side roller is larger than the thermal capacity per unit surface area of said intermediate transfer medium.

7. The image forming apparatus of claim 6, wherein the thermal capacity per unit surface area of said back surface side roller is larger than the thermal capacity per unit surface area of said front surface side roller.

8. The image forming apparatus of claim 6, wherein said secondary transfer means further comprises a back surface side auxiliary roller which is disposed on the back surface side to said intermediate

transfer medium on the downstream side to said heating means along the rotating direction of said intermediate transfer medium but the upstream side to said secondary transfer position, and which rotates while abutting on said intermediate transfer medium; and

the thermal capacity per unit surface area of said back surface side auxiliary roller is larger than the thermal capacity per unit surface area of said intermediate transfer medium.

9. The image forming apparatus of claim 6, further comprising temperature adjusting means which adjusts a surface temperature of said roller whose thermal capacity per unit surface area is larger than the thermal capacity per unit surface area of said intermediate transfer medium.

10. The image forming apparatus of claim 6, further comprising transfer bias applying means which applies a transfer bias upon said secondary transfer means to thereby facilitate transfer of toner onto said recording medium from said intermediate transfer medium.

11. The image forming apparatus of claim 1, wherein said heating means increases the temperature of toner particles which form said primarily transferred toner image up to or beyond the melting point of said toner particles; and

said secondary transfer means ensures that the temperature of said

recording medium at said secondary transfer position is equal to or lower than the boiling point of water.

12. The image forming apparatus of claim 11, wherein the melting point of said toner particles is equal to or lower than the boiling point of water.

13. The image forming apparatus of claim 1, wherein said heating means comprises a contact heater which is disposed on the back surface side to said intermediate transfer medium, abuts on a back surface of said intermediate transfer medium and heats up said intermediate transfer medium.

14. The image forming apparatus of claim 1, wherein said intermediate transfer medium comprises a conductive heater member; and
said heating means comprises an alternating field generator which applies an alternating field upon said intermediate transfer medium so that said conductive heater member develops heat.

15. The image forming apparatus of claim 14, wherein said alternating field generator is disposed on the back surface side to said intermediate transfer medium.

16. The image forming apparatus of claim 1, wherein said heating

means comprises a radiant heater which is disposed on the front surface side to said intermediate transfer medium.

17. The image forming apparatus of claim 1, wherein an electrostatic latent image on said latent image carrier is visualized with a developing agent which contains toner particles and said toner image is formed on said latent image carrier; and

said developing agent is a single-component developing agent which is comprised only of toner particles.

18. The image forming apparatus of claim 1, wherein an electrostatic latent image on said latent image carrier is visualized with a developing agent which contains toner particles and said toner image is formed on said latent image carrier; and

said developing agent is a liquid developer which is obtained by dispersing toner particles in a carrier liquid.

19. The image forming apparatus of claim 18, wherein a toner concentration within said liquid developer is from about 5 w% to about 40 w%.

20. An image forming method in which a toner image carried on a latent image carrier is primarily transferred onto a surface of an intermediate transfer medium which rotates and a primarily transferred

toner image thus formed on said intermediate transfer medium is secondarily transferred and fixed at the same time on a recording medium, comprising:

a heating step of heating a primarily transferred toner image which has not been secondarily transferred yet; and

a transferring/fixing step of secondarily transferring and concurrently fixing said primarily transferred toner image on said recording medium while cooling said intermediate transfer medium.

21. An image forming apparatus comprising:

transfer means which transfers a toner image formed on an image carrier onto a recording medium; and

fixing means which fixes, at a predetermined fixing temperature, a toner image transferred onto said recording medium by said transfer means, wherein after a toner image has been transferred and fixed on one side surface of said recording medium, a toner image is transferred and fixed on the other side surface of said recording medium;

said fixing means sets at least a fixing temperature for fixing a toner image on one side surface of said recording medium to 100 °C or lower; and

said transfer means sets a transfer condition for transferring a toner image on one side surface of said recording medium to be the same as a transfer condition for transferring a toner image on the other side surface of said recording medium.

22. The image forming apparatus of claim 21, further comprising image forming means which forms a toner image on said image carrier using a liquid developer which is obtained by dispersing toner in a carrier liquid.

23. The image forming apparatus of claim 21, wherein said toner image formed on said image carrier is a color image.

24. The image forming apparatus of claim 21, further comprising:
detecting means which detects an ambient environment around said transfer means; and

transfer condition determining means which determines said transfer conditions based on a result of the detection obtained by said detecting means.

25. An image forming method of forming toner images on the both surfaces of a recording medium, comprising:

a first stage transfer step of transferring a toner image formed on an image carrier onto one side surface of a recording medium;

a first stage fixing step of fixing said toner image which has been transferred onto one side surface of said recording medium, at a fixing temperature of 100 °C or lower on one side surface of said recording medium;

a second stage transfer step of transferring a toner image formed on said image carrier onto the other side surface of said recording medium which has been processed at said first stage fixing step, under the same transfer condition to that used at said first stage transfer step; and

a second stage fixing step of fixing, on the other side surface of a recording medium, said toner image which has been transferred onto the other side surface of a recording medium.